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Daylily Leaf Streak[1]

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INTRODUCTION: Daylilies *(Hemerocallis* spp. L.) are used extensively throughout the United States as a colorful addition to sunny and partially shaded landscapes. Thousands of varieties have been developed, each providing about a month of showy blooms during seasons that overlap from spring to early fall. Once established in a landscape setting, daylilies require relatively low maintenance. *Hemerocallis* spp. are quite drought tolerant with no special pH or fertilizer requirements. In addition, daylilies generally have few insect and disease problems.

PATHOGEN: Daylily leaf streak is caused by *Aureobasidium microstictum* (Bubak) W. B. Cooke (syn. *Kabatiella microstictum* Bubak) (Hermanides-Nijhof 1977). The disease first attracted serious attention in Mississippi in 1968 and the pathogen was provisionally named *Gloeocephalus hemerocalli* (Spencer 1968). The daylily leaf streak pathogen has also been reported from: 1) Louisiana as *Collecephalus hemerocalli* J. A. Spencer (Holcomb 1976); 2) Pennsylvania, also as C. *hemerocalli* (Rhoades 1974); 3) Maryland as *Kabatiella* sp. *(microsticta?)* (Anonymous 1960) and *Collecephalus hemerocalli* J. A. Spencer var. *macrosporum* J. N. Lunsford and J. A. Spencer (Lunsford and Spencer 1976); 4) Virginia as C. *hemerocalli* (Lyons 1993); and 5) Japan as A. *microstictum* (Yoshikawa and Yokoyama 1987). The disease was first reported in Florida in 1984, at which time the taxonomic confusion concerning the pathogen was recognized (Alfieri *et al.* 1993).

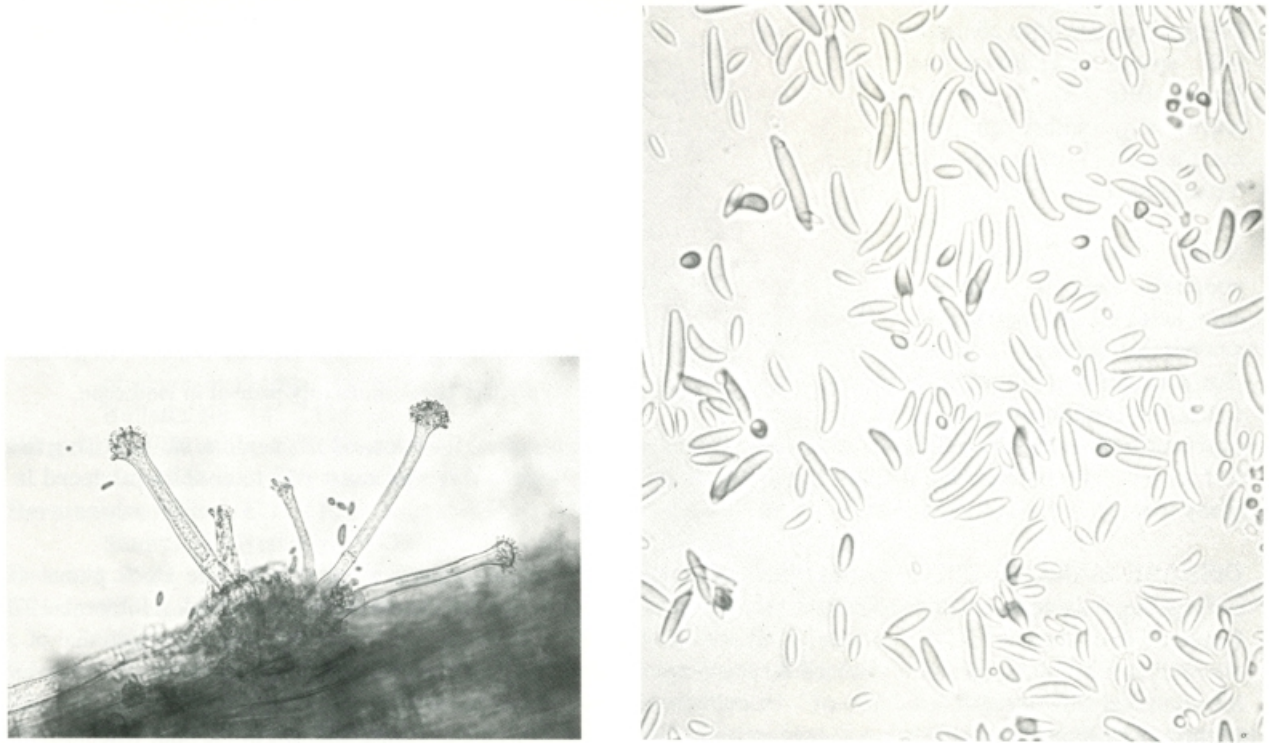

Fig. 1. Conidiogenous cells protruding from an acervulus, showing typical swollen tips, denticles and conidia.

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A. microstictum is a black yeast that causes leaf lesions on several members of the Amaryllidaceae and Liliaceae. Besides *Hemerocallis* sp., other known hosts of this fungus include *Convallaria majalis L., Lilium* sp. L., *Polygonatum multiflorum L. (All.),* and *Iris* spp. L. (Fan 1989).

Aureobasidium microstictum forms acervular fruiting bodies composed of tightly interwoven hyphae which form within foliar lesions. The acervuli give rise to apically swollen conidiogenous cells which erupt through the leaf epidermis, typically protruding through the stomata. Hyaline ellipsoidal one-celled spores (conidia) of varying sizes develop on denticles (small peg-like structures) that are produced on the swollen heads of the conidiogenous cells (Fig. 1) (Hermanides-Nijhof, 1977: Yoshikawa and Yokoyama 1987). *A. microstictum* is easily isolated on acidified potato dextrose agar. In culture, the pathogen is initially cream to peach-colored and appears slimy. As it matures, the culture becomes very dark brown to black with sparse aerial hyphal development (Yoshikawa and Yokoyama 1987).

SYMPTOMS:

Initial symptoms of daylily leaf streak consist of chlorosis along the midvein followed by necrosis within both the chlorotic and surrounding green tissue. Chlorotic symptoms usually develop from the leaf tip downward. Small reddish-brown flecks and oval, elongated necrotic spots develop on infected foliage. Lesions often coalesce and spread lengthwise on leaves (Fig. 2). Infected leaves may wither and die completely (Yoshikawa and Yokoyama 1987).

Small, white acervular structures may be observed sporulating on both surfaces of necrotic foliar lesions (Hermanides-Nijhof 1977). Often, the conidiogenous cells produced within the acervuli can be seen with a dissecting microscope or hand lens as filamentous stalks arising from leaf tissue. The swollen tips of the conidiogenous cells may appear shiny or moist due to conidia produced in a slimy matrix.

Fig. **2.** Typical symptoms of daylily leaf streak on daylily planted in landscape.

DISEASE MANAGEMENT: Daylily leaf streak may be avoided by purchasing disease-free stock plants and propagating only from healthy specimens. Varieties differ markedly in susceptibility to leaf streak (Holcomb 1976; Lunsford and Spencer 1976), so careful choice of varieties can nearly eliminate the disease. Conidia of A. *microstictum* are most commonly spread by water splash, therefore, minimizing overhead irrigation should reduce infection and slow disease development. Inoculum can also be transferred from plant to plant by human or animal contact or by tools, especially when leaves are wet. Leaf streak is worse in spring and fall in Florida, when daytime temperatures do not exceed 90° F. Infected daylilies should be isolated from healthy plants to help curtail inoculum spread. Fungicide may be applied to slow disease development and protect susceptible new growth from infection. Thiophanate methyl, mancozeb, chlorothalonil, and iprodione may be used for control (Simone et al. 1993). Preventative control of this disease may be achieved by applying fungicide early in the spring as new growth emerges and before disease symptoms are observed.

Fig. 3. Chlorotic and necrotic leaf streaking associated with daylily leaf streak disease.

SURVEY & DETECTION: Daylilies infected with *A. microstictum* commonly exhibit chlorotic and necrotic streaks down the midvein of affected leaves (Fig. 3). Leaf tissue adjacent to the midvein may also become chlorotic. Associated green and chlorotic leaf tissue will develop small reddish-brown flecks and larger oval, elongated lesions extending up and down infected leaves. Close examination of symptomatic leaves with a hand lens may reveal small whitish fruiting bodies (acervuli) on upper and lower surfaces of necrotic leaf spots. Spore-producing structures within acervuli (conidiogenous cells) may be visible as small filaments or stalks with shiny, glistening heads.

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